MIL ChiP DCM2322 EMI Test Report

Input Voltage Range : 14 – 72V, 43V (Nominal Line)
Output Voltage : 28V (Nominal)
EMI Filtering : CE101, CE102

Summary:

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>EMI Filter</th>
<th>Output Capacitor (C_{OUT-EXT}) Min, Max Cap</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 V</td>
<td>Two Stage</td>
<td>470uF, 5000uF</td>
<td>PASS</td>
</tr>
<tr>
<td>43 V</td>
<td>Two Stage</td>
<td>470uF, 5000uF</td>
<td>PASS</td>
</tr>
<tr>
<td>72 V</td>
<td>Two Stage</td>
<td>470uF, 5000uF</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Prepared by:
Vamshi Domudala
Applications Engineering
Date: 6/4/2020
Model Details:

ChiP DCM: DCM2322T72S31A0T60

EMI tests performed as per MIL-STD-461:

CE101
CE102
<table>
<thead>
<tr>
<th>REFERENCE DESIGNATOR</th>
<th>DESCRIPTION</th>
<th>MFG PART NUMBER</th>
<th>MANUFACTURER</th>
<th>QUANTITY</th>
<th>VALUE NOM</th>
<th>RATING NOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1, C2, C3, C4</td>
<td>Capacitor</td>
<td>C1812C103KGRACTU</td>
<td>KEMET Corporation</td>
<td>4</td>
<td>10000pF</td>
<td>2000V</td>
</tr>
<tr>
<td>C5 - C9, C11 - C15</td>
<td>Capacitor</td>
<td>GA355DR7GF472KW01L</td>
<td>Murata Manufacturing</td>
<td>10</td>
<td>4700pF</td>
<td>250V</td>
</tr>
<tr>
<td>C10</td>
<td>Capacitor</td>
<td>C5750X7T2E225M250KA</td>
<td>TDK</td>
<td>1</td>
<td>2.2uF</td>
<td>250V</td>
</tr>
<tr>
<td>C16 - C72</td>
<td>Capacitor</td>
<td>GRM32EC72A106KE05L</td>
<td>Murata Manufacturing</td>
<td>57</td>
<td>10uF</td>
<td>100V</td>
</tr>
<tr>
<td>COUT_EXT1</td>
<td>Min/Max from the Chip DCM datasheet</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L1, L2</td>
<td>Ind Com Mode 7065</td>
<td>45923-221</td>
<td>Vicor</td>
<td>2</td>
<td>220uH</td>
<td>10.5A</td>
</tr>
<tr>
<td>PS1</td>
<td>DCM2322 14 - 72Vin</td>
<td>DCM2322</td>
<td>Vicor</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1, R2</td>
<td>Resistor</td>
<td>RC1206FR-101RL</td>
<td>Yageo</td>
<td>2</td>
<td>1Ω</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>Resistor</td>
<td>ERJ-1TRQR1R5U</td>
<td>Panasonic</td>
<td>1</td>
<td>1.5Ω</td>
<td></td>
</tr>
<tr>
<td>R4, R5</td>
<td>Resistor</td>
<td>ERJ-1TRSR15U</td>
<td>Panasonic</td>
<td>2</td>
<td>0.15Ω</td>
<td></td>
</tr>
</tbody>
</table>
Test setup details:
EMI Filter

A 50Ω termination is used for LISN and voltage across the RED and BLACK leads are measured at various load conditions.

**LISN Part Number:**
Solar Electronics Company
TYPE 8028-50-BP-24-BNC

**EMI Receiver:**
Rohde & Schwarz
Model #
ESIB7.1088.7490.07
Serial # M002397

**Pasternack**
20dB Attenuator

**Electronic Load**
Kikusui
PLZ1003WH
3504

**Clamp-On Current Probe**
Extech /380947
Serial # 00004085

HP DC power supply Model 6015A
EMI Base Scan with a 15Ω resistive load:

Note that there is a low frequency noise in the range of 10 - 15 kHz is present in the EMI screen room. For a base line of the low frequency noise, shown in the below EMI scan, the power supplies is loaded with 15Ω resistive load.

Low frequency noise can be observed in all the CE102 scans, please note that the DUT under test (DCM) is not the source of the low frequency noise.
CE101 Test Results: RED LEAD

Figure 1: Vin 14V, Vout 28V, Load 0%, Cout 470uF

Figure 2: Vin 14V, Vout 28V, Load 100%, Cout 470uF

Figure 3: Vin 14V, Vout 28V, Load 0%, Cout 5000uF

Figure 4: Vin 14V, Vout 28V, Load 100%, Cout 5000uF
Figure 5: Vin 43V, Vout 28V, Load 0%, Cout 470uF

Figure 6: Vin 43V, Vout 28V, Load 100%, Cout 470uF

Figure 7: Vin 43V, Vout 28V, Load 0%, Cout 5000uF

Figure 8: Vin 43V, Vout 28V, Load 100%, Cout 5000uF
Figure 9: Vin 72V, Vout 28V, Load 0%, Cout 470uF
Figure 10: Vin 72V, Vout 28V, Load 100%, Cout 470uF
Figure 11: Vin 72V, Vout 28V, Load 0%, Cout 5000uF
Figure 12: Vin 72V, Vout 28V, Load 100%, Cout 5000uF
CE101 Test Results: BLACK LEAD

Figure 13: Vin 14V, Vout 28V, Load 0%, Cout 470uF

Figure 14: Vin 14V, Vout 28V, Load 100%, Cout 470uF

Figure 15: Vin 14V, Vout 28V, Load 0%, Cout 5000uF

Figure 16: Vin 14V, Vout 28V, Load 100%, Cout 5000uF
Figure 17: Vin 43V, Vout 28V, Load 0%, Cout 470uF

Figure 18: Vin 43V, Vout 28V, Load 100%, Cout 470uF

Figure 19: Vin 43V, Vout 28V, Load 0%, Cout 5000uF

Figure 20: Vin 43V, Vout 28V, Load 100%, Cout 5000uF
Figure 21: Vin 72V, Vout 28V, Load 0%, Cout 470uF

Figure 22: Vin 72V, Vout 28V, Load 100%, Cout 470uF

Figure 23: Vin 72V, Vout 28V, Load 0%, Cout 5000uF

Figure 24: Vin 72V, Vout 28V, Load 100%, Cout 5000uF
CE102 Test Results: RED LEAD

Figure 3: Vin 14V, Vout 28V, Load 0%, Cout 470uF

Figure 4: Vin 14V, Vout 28V, Load 100%, Cout 470uF

Figure 3: Vin 14V, Vout 28V, Load 0%, Cout 5000uF

Figure 4: Vin 14V, Vout 28V, Load 100%, Cout 5000uF
CE102 Test Results: BLACK LEAD

**Figure 13:** Vin 14V, Vout 28V, Load 0%, Cout 470uF

**Figure 14:** Vin 14V, Vout 28V, Load 100%, Cout 470uF

**Figure 15:** Vin 14V, Vout 28V, Load 0%, Cout 5000uF

**Figure 16:** Vin 14V, Vout 28V, Load 100%, Cout 5000uF
Figure 22: Vin 72V, Vout 28V, Load 100%, Cout 470uF

Figure 24: Vin 72V, Vout 28V, Load 100%, Cout 5000uF